

# PATENT SPECIFICATION

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## DRAWINGS ATTACHED

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## (54) CLEANSING AGENT HAVING A SHELL STRUCTURE

- (71) We, RAION YUSHI KABUSHIKI KAISHA, a Japanese Company, of No. 2-26, 1-chome, Yokohama-cho, Sumida-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—
- The present invention relates generally to cleansing agents and more particularly to cleansing agents in the form of a unitary body having a shell structure consisting of a plurality of shells including a capsule type shell structure made from two hollow semi-spherical shells.
- Cleansing agents are widely used in the form of powders because the spray drying method used in the production of the powder is very effective in practice, but has some defects. For instance, the production apparatus is large in size and very expensive and it is difficult to produce powders which are uniform in grain size. The mechanical strengths of the powder or particles are not strong so that it is very difficult to prepare the compositions of the slurry of detergents in order that the particles thereof may not be crushed into a finely divided powder. Limited is the use of sodium silicate which has a high detergency and is inexpensive and is used for preventing the production in large quantities of  $\text{SiO}_2$  which is dissolved in water during washing so that the water becomes muddy.
- The cleansing agent produced by the spray drying method has better fluidity or viscosity so that the packing process can be simplified. However, the powder tends to irritate the eyes and noses of the operators in the factory and the users or consumers so that they feel discomfort when handling the powder.
- According to the present invention there is provided a cleansing agent in the form of a unitary body having a shell-like structure comprising a plurality of shells each of which is made of detergent and/or detergent additive, the space defined by the shells being filled with a filler which consists of detergent and/or detergent additive, at least one of said shells and said filler containing therein detergent, and said filler being completely surrounded by said shells. The invention also provides an integral cleansing agent having a shell structure, in the form of sphere, cube, cylinder, etc., said shell structure having a plurality of shells which are made of detergents and/or detergent additives.
- The dimensions of the cleansing agent may be suitably selected so that it may contain a cup of conventional cleansing agent powder as a unit in use so that it is not necessary to measure out the quantity of cleansing agent when washing. Furthermore, the integral cleansing agent contains therein not only a detergent but also detergent additives such as amphoteric surfactants for soft finishing of textiles, whitening agents, etc., so that it is not necessary at all to buy these additives separately and measure and add them to the detergent. The cleansing agent in accordance with the present invention has a novel shape and construction such that when the individual cleansing agents are packed into bags made of polyethylene and sealed, it is not necessary to seal a box or container into which a number of such cleansing agents are packed for shipment. Thus, the overall costs may be advantageously reduced.
- Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:—
- Figs. 1, 2 and 3 are diagrammatical perspective views of three embodiments of the invention;
- Figs. 5 and 6 are sectional views of further embodiments of the invention; and

Figs. 7 to 11 are sectional views of further embodiments of the invention.

Figs. 1 to 3 illustrate cleansing agents in accordance with the present invention each cleansing agent having a plurality of shells. Depending upon the production methods, the detergent may be formed in various shapes such as the sphere shown in Fig. 1, the cube shown in Fig. 2 or other solids. The slurry of detergent is first cooled and mixed in a high speed mixer so that the cores are formed. The cores are coated by, for example, an immersion method with a detergent additive different from the detergent forming the cores, so that the shells are formed around the cores.

In case of the cylindrical detergent shown in Fig. 3, the slurry of detergent is extruded in the form of strings and then cut into a predetermined length. In the similar manner as described above, the shells may be formed upon the cylindrical cores.

Fig. 5 illustrates in section the shell construction of a cleansing agent, a layer of an amphoteric surfactant for soft finishing of textiles being formed around the core 1 made from a slurry of a detergent composition as hereinafter described.

A shell 3 of whitening agent is further coated upon the detergent shown.

In Fig. 6, the layers of shells 3 and 2 of whitening agent and amphoteric surfactant are alternately formed upon the core 1. It is to be noted that the detergent of which the core is made may be employed as coating material in addition to or instead of detergent additives.

In another embodiment (not shown) in accordance with the present invention, the core consists of whitening agent, an inner shell is made of amphoteric surfactant for soft finishing of textiles and an outer shell is made of detergent. Thus, when used in washing, the detergent dissolves first and the whitening agent last, which may be the order desired in a washing operation. It is clear that the kinds and numbers of the coating layers or shells may be varied for particular purposes. For instance, a cleansing agent may have dimensions such that it contains sufficient detergent, detergent additives such as whitening agent and amphoteric surfactant for a single washing cycle of a particular washing operation.

The slurry of the detergent used in the present invention will be described hereinafter and contains a relatively large amount of sodium silicate which can be varied in a wide range from 20 to 95% on a dry basis. A foaming agent such as toluenesulphonylhydrazides or azodicarboxylic-acidamides may be added to the slurry in quantities of 0.1 to 5%. When the foaming agent is added, the porous construction may be obtained as will be described in more detail

hereinafter. The slurry contains all or some of an alkylbenzene sodium sulphonate, sodium-tripoly-phosphate, soda ash and perfumes.

Referring now to Figs. 7 and 8, the slurry of detergent is formed by compression moulding into a pair of hollow semi-spherical shells 11 and 12 having flanges 11a and 12a respectively. The hollow portion defined by the pair of shells 11 and 12 is filled with granular detergent, an amphoteric surfactant for soft finishing of textiles and a whitening agent, all of which are generally indicated at 4. Thereafter, the flanges 11a and 12a are pressed against each other and heated, thereby thermally welding at 13, the pressure applied to the flanges 11a and 12a being so selected that the flanges do not fracture. Since the slurry of the detergent may be melted when heated and may have some rigidity when dried, the pair of hollow semi-spherical shells 11 and 12 may be thermally welded as described above.

In the embodiment shown in Fig. 8, the shells 101 and 102 are formed by heating the slurry of detergent containing a foaming agent in molds at a temperature higher than 90°C. Gas is liberated from a component contained in the foaming agent. The shells 101 and 102 consequently include many bubbles 5 so that the solubility of the cleansing agent in water may be much improved. The bubbles may be formed by utilizing the water content in the slurry by adjusting the heating and other conditions without use of a foaming agent.

In the embodiment shown in Fig. 9, two semi-spherical shells 111 and 112 having no flange are formed in the same manner as described hereinabove from the slurry of the detergent. The shell 111 is fitted over the shell 112 so as to form a capsule which is filled with the detergent and/or detergent additives 4.

In the embodiment shown in Fig. 10, an upper shell 121 has a circular ridge 121b which is fitted into a circular groove 122b formed in the outer wall of a lower shell 122. In this embodiment, the shells 121 and 122 have bubbles 5 similar to those shown in the embodiment of Fig. 8.

In the embodiment shown in Fig. 11, shells 131 and 132 are in the form of hollow regular prisms or right circular cylinders. It should be understood that the fillers 4 which are used to fill the capsules formed by the shells in the above described embodiments are not limited to solid fillers and that they can be filled with a jelly 6 as shown in Fig. 11.

#### WHAT WE CLAIM IS:—

1. A cleansing agent in the form of a unitary body having a shell-like structure comprising a plurality of shells each of which is

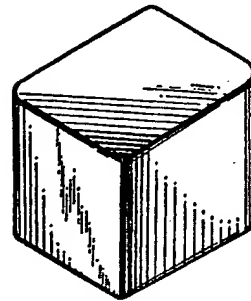
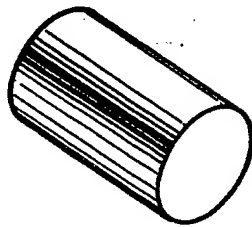
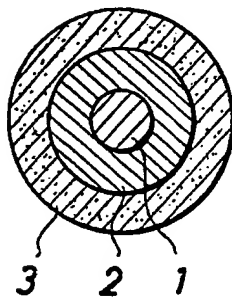
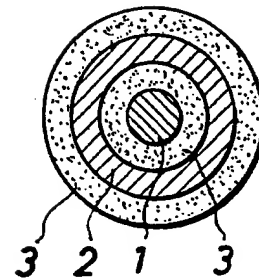
**FIG.1****FIG.2****FIG.3****FIG.5****FIG.6**

FIG.7

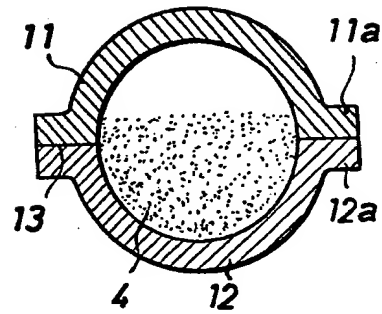


FIG.8

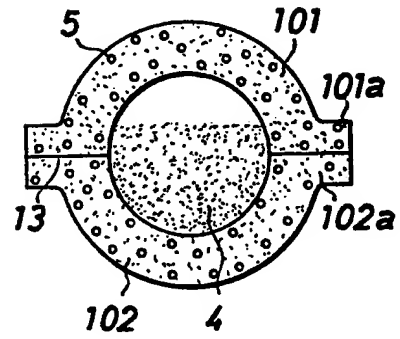


FIG.9

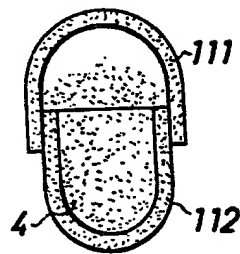


FIG.10

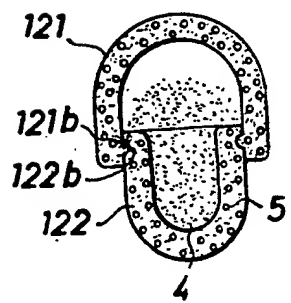


FIG.11

